

MASTER SCANNER FRAME
NO. 1 ESS ARRANGED WITH 2-WIRE, 4-WIRE, AND DATA FEATURES OR
NO. 2 ESS ARRANGED WITH 2-WIRE FEATURES OR
AUTOMATIC INTERCEPT CENTER NO. 1A IN AIS
EQUIPMENT DESIGN REQUIREMENTS
ELECTRONIC SWITCHING AND TRAFFIC SERVICE SYSTEMS

1. GENERAL

Description

Scope

1.01 This specification, together with the supplementary information listed herein, covers the equipment design requirements for the framework, equipment, and wiring to be used in the manufacture and installation of the master scanner frame.

1.04 The master scanner (MS) is a single-bay frame 2 feet 2 inches wide and is used for administrative and diagnostic scanning of all other frames in an office. Mounted on the frame (see Fig. 1) are the 1024 ferrod sensors plus control equipment, duplicated for reliability, and frame control panel, fuse panel, and power supply filters.

1.02 This specification is reissued:

1.05 Switchboard cable pairs are run on the front of the frame and are terminated directly on ferrod sensor terminals. The frame is provided with cable rings and the sensor apparatus mountings with cable brackets plus fanning strips to facilitate running these pairs as loose wire, eliminating the need for forming and sewing by the installer.

(a) To change the title and add Bell System Practice references.

(b) To add power status and alarm reporting feature for use with Automatic Intercept Center No. 1A in AIS.

(c) To add List 5 to J1A043B.

(d) To add List 5 and Note A to J1A043BA.

(e) To change No. 2 ESS assignment drawing from SD-2H081-01 to SD-2H167-01.

1.06 The ferrod sensor is the basic unit of the scanner. It can be considered a 2-winding transformer with a ferrite core whose coupling (the ability to induce a signal from the primary winding to the secondary winding) is controlled by the current in a third control winding. The primary and secondary windings of the transformer are associated with the access and readout equipment and are referred to as the interrogate and readout windings, respectively. The control windings are connected to the circuit which requires scanner monitoring. The interrogate signal induces a signal into the readout winding, provided there is insufficient current in the control windings to inhibit any coupling.

Capacity

1.03 The master scanner frame is equipped with 512 ferrod sensor assemblies. Each ferrod sensor assembly contains two ferrod sensors in a package; thus the frame capacity is 1024 scan points.

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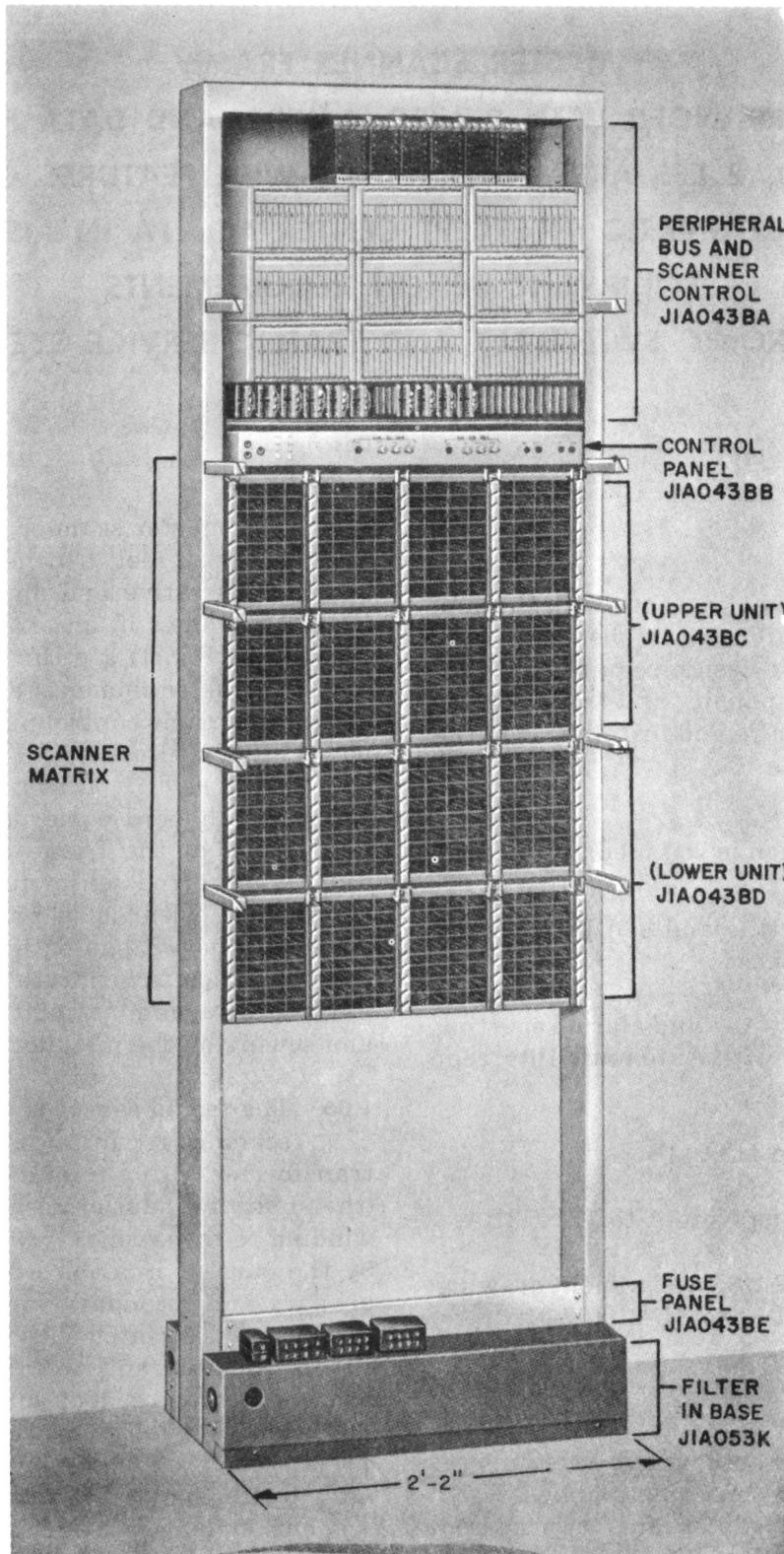


Fig. 1 — Master Scanner

1.07 The control equipment provides the means for interrogating the sensors and converting the readouts to signals which can be used by other parts of the system.

1.08 The ferrod sensors are arranged in a matrix of 64 horizontal rows of 16 with each row having a specific address. One of the control systems when directed by an enable signal extends peripheral communication bus address signals for a particular row to a coincident type of core matrix. From the coincidence of signals in the matrix the proper sensor row interrogate leads are pulsed, causing the flux in the sensor ferrite to switch if no current is flowing in the control winding. This in turn induces a pulse in the readout winding. If current is flowing in the control winding, the sensor ferrite will be saturated and an interrogate pulse will not produce a signal in the readout winding.

1.09 The 16 readout leads of all rows are multiplied vertically and connected to 16 peripheral communications bus answer-back leads. Knowing which row has been addressed, a check of answer-back signals can indicate the state of any of the 1024 sensors; hence the status of the equipment being monitored. The peripheral communication bus is duplicated so that either controller can operate on either bus with selection being made by the central pulse distributor via enable leads.

1.10 Power is fed to this frame from duplicated power distribution frames (PDF). A pair of No. 12 gauge feeders from each PDF supplies +24 volts and ground to the controller systems. The power feeders are terminated at the top of the frame with special connectors that connect them to cables which run down the inside of the frame uprights to filter equipment located in the base of the frame. The filter equipment is connected to the fuse panel located in the bottom plate position. Here the power is fed to the frame control panel and power relays through 70-type fuses of the self-indicating type. A blown fuse actuates the fuse alarm relay, causing an office major alarm. At the same time another master scanner frame detects the trouble, and the trouble is indicated on the teletypewriter.

1.11 A frame control panel provides test voltage, ground, telephone, and spare jacks as well as keys to transfer scanner and bus controller functions manually. Normally, controllers are transferred automatically by central control via the central pulse distributor. Selection of the controller to which power is connected is normally under control of the central control via the central pulse distributor. Power to the controller can be switched locally by means of keys on the frame control panel. Operation of one of these keys transfers power and sounds an office minor alarm unless the controller to be taken out of service is quarantined by means of the teletypewriter. Lamps associated with these transfer keys indicate the status of the power for each controller, and another master scanner frame also monitors the controller power status advising central control.

1.12 Because offices vary in size and services, assignment of most scan points must be done on a job basis as covered by one of the following Assignment of Master Scan Points drawings:

- (a) SD-1A272-01 for No. 1 ESS Arranged With 2-Wire and Data Features
- (b) SD-2A044-01 for No. 1 ESS Arranged With 4-Wire Features
- (c) SD-2A047-01 for No. 1 ESS Arranged With 4-Wire Features (NORAD)
- (d) SD-1B252-01 for Automatic Intercept Center No. 1A in AIS.
- (e) SD-2H167-01 for No. 2 ESS Arranged With 2-Wire Features

1.13 Scan points that are scanned in a cyclic rate of 100 msec or faster by a supervisory program are termed supervisory scan points.

1.14 Scan points that are scanned by the direction of a noncyclic program are termed directed scan points.

1.15 Typical scan rates are 10, 20, 50, or 100 msec.

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1.16 In any office certain scan points are not subject to change, ie, monitor bus scan points, diagnostic bus scan points, and central control scan points. These points are always assigned to fixed locations in the matrix of the first master scanner frame in the office. These scan points require a fixed resistor shunted across the sensor control winding terminals. See Note 5.04.

1.17 The control windings of the ferrod sensors consist of two windings with four terminals appearing on the front of the sensor. Since most scan point applications require 2-wire operation, a strap must be added on the appropriate terminals connecting the two wind-

ings series aiding. A few applications, mostly trunks, require the use of both coils. In this case battery and ground are cabled from the remote frame together with the normal two operating wires. In cases where the same battery and ground serve more than one sensor, these leads are multiplied on the sensors. See Note 5.04.

Floor Plan Arrangements

1.18 The master scanners should be centrally located among the frames they serve so as to minimize cabling. Cross-aisle racks should be run directly over the master scanner frames to reduce cable congestion in the aisle racks.

SUBDIVISIONS OF EQUIPMENT AND DETAILED INDEX

WECO J drawings should be ordered by referring to the prefix and base number and requesting the current dash (-) number.

EQUIPMENT CODE	RATING OF UNIT	TITLE	EQUIPMENT DRAWING	CIRCUIT DRAWING	CKT PER UNIT	2-INCH MTG PLATES PER UNIT
J1A043B	AT&TCo Std	Master Scanner Frame	J1A043B(-)	SD-1A209-01	Frame	-
J1A043BA	AT&TCo Std	Peripheral Bus and Scanner Control Unit	J1A043BA(-)	SD-1A209-01	1	9
J1A043BB	AT&TCo Std	Frame Control Unit	J1A043BB(-)	SD-1A209-01	1	1
J1A043BC	AT&TCo Std	Scanner Matrix Upper Unit	J1A043BC(-)	SD-1A209-01	1	9
J1A043BD	AT&TCo Std	Scanner Matrix Lower Unit	J1A043BD(-)	SD-1A209-01	1	9
J1A043BE	AT&TCo Std	Fuse Panel Unit	J1A043BE(-)	SD-1A209-01	1	1
J1A053K	AT&TCo Std	No. 1 ESS Filter Unit	J1A053K(-)	SD-1A209-01	1	Spl

Circuit Schematic Index

CIRCUIT DRAWING	CODE J1A043 EQUIP.
SD-1A209-01	B,BA,BB,BC,BD,BE

2. SUPPLEMENTARY INFORMATION

- 800-000-000—General Equipment Requirements Installation and Manufacturing Index
- 820-000-000—No. 1 and No. 2 ESS Index
- 821-000-000—Traffic Service System Index
- 996-100-100—General Description No. 1 ESS
- J1A052 (820-050-150)—End Guards, Aisle Pilot Lamps and Alarm Sending Units
- J1A053 (820-053-150)—Frame Filter Panels
- J1A054—Cable Racks
- J1A055 (820-001-150)—Central Office Equipment—General—No. 1 ESS
- J1A056 (820-009-150)—Limiting Conductor Conditions
- J2H000—Central Office Equipment—General—No. 2 ESS

Floor Plan Data—Section 12

E8056—Questionnaire

Current Drain Data—SD-1A101-01—No. 1 ESS
 —SD-2H100-02—No. 2 ESS Arranged With 2-Wire Features

3. DRAWINGS

For additional drawings forming a part of this specification, see listings under Subdivisions of Equipment and Detailed Index.

Keysheet

- SD-1A100-01—No. 1 Electronic Switching System—Arranged With 2-Wire and Data Features
- SD-1B151-01—Automatic Intercept Center—No. 1 in AIS
- SD-2H100-01—No. 2 Electronic Switching System—Arranged With 2-Wire Features

Framework

- ED-1A150-70—Single-Bay Frame
- ED-1A157-71—Appliance Outlet

Equipment

- ED-1A183-10 } Specific Requirements for
- ED-1A183-11 } Numbering and Lettering
- ED-1A201-01—Mounting of 22-, 23-, and 24-Type Fuse Blocks

Wiring and Cabling

- ED-1A153-01—Table of Wire Gauges and Types of Insulation
- ED-1A159-01—Method of Terminating Battery and Ground Feeders
- ED-1A182-10 } Specific Requirements for
- ED-1A182-11 } Installation of Cable Rack
- ED-1A182-13 }
- ED-1A200-01—Method of Running Power Feeders
- ED-1A207-01—Switchboard Cabling Details
- ED-1A227-10—Method of Running Switchboard Cables

4. EQUIPMENT

J1A043B (AT&T Co Std)—Master Scanner Frame

Equipment—J1A043B(-)

List 2—Framework, assembly, wiring, and common equipment for one master scanner frame (1024-point). (See Note A and 5.04.)

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	WIRE	EQUIP	SEE NOTES
Master Scanner Ckt, SD-1A209-01:			
Scanner Control, Fig. 1	1	0	B
Frame Control, Fig. 2, 8	1	0	B
Scanner Matrix (Upper Unit), Fig. 3	1	0	B
Scanner Matrix (Lower Unit), Fig. 4	1	0	B
Peripheral Bus Control, Fig. 5	1	0	B
Fuses, Fig. 9	1	0	B
Appliance Outlets, Fig. 10	2	2	
Filters, Fig. 11	2	2	

List 3—Assembly, wiring, and equipment required in addition to list 2 for No. 1 ESS office arranged with 2-wire, 4-wire, and data features

	WIRE	EQUIP
Master Scanner Ckt, SD-1A209-01:		
Peripheral Bus Control, Fig. 6, 12	1	0
Scanner Control, X Option in Fig. 1	1	—

List 4—Assembly, wiring, and equipment required in addition to list 2 for No. 2 ESS office arranged with 2-wire features or Automatic Intercept Center No. 1A in AIS

	WIRE	EQUIP
Master Scanner Ckt, SD-1A209-01:		
Peripheral Bus Control, Fig. 7, 12	1	0
Scanner Control, T Option in Fig. 1	1	0

List 5—Wiring and equipment always required in addition to list 2 and 4 for Automatic Intercept Center No. 1A in AIS to provide power status and alarm reporting.

	WIRE	EQUIP
Master Scanner Circuit, SD-1A209-01:		
Peripheral Bus Control, J Option in Fig. 5, 12	1	0

Notes

A. Component units shall be furnished in accordance with Table A.

B. This wiring is required to interconnect frame units.

J1A043BA (AT&T Co Std)—Peripheral Bus and Scanner Control Unit

Equipment—J1A043BA-()

List 2—Assembly, wiring, and common equipment for one peripheral bus and scanner control unit per SD-1A209-01, Fig. 1 and 5.

List 3—Assembly, wiring, and equipment required in addition to list 2 for No. 1 ESS offices arranged with 2-wire, 4-wire, and data features per SD-1A209-01, Fig. 6, 12 and X option in Fig. 1. (See Note A.)

List 4—Assembly, wiring, and equipment required in addition to list 2 for No. 2 ESS office arranged with 2-wire features or Automatic Intercept Center No. 1A in AIS per SD-1A209-01, Fig. 7, 12 and T option in Fig. 1. (See Note A.)

List 5—Wiring and equipment always required in addition to lists 2 and 4 for Automatic Intercept Center No. 1A in AIS to provide power status and alarm reporting per SD-1A209-01, option J in Figs. 5 and 12.

Notes

A. Options N, Q, and R are related to the feature of monitoring the frame power status (S, F, and T scan points) and are assigned in accordance with each systems assignment rules drawing:

1. For No. 1 ESS—Provide R option (S, F, and T scan points).
2. For No. 2 ESS—Provide the following:

- (a) Q option for MS0.
- (b) N option when MS1 monitors S1 and F1 scan points.
- (c) R option when either 2 (a) or 2 (b) does not apply.

3. For AIS—Provide R option (S and F scan points).

J1A043BB (AT&TCo Std)—Frame Control Unit

Equipment—J1A043BB-()

List 2—Assembly, wiring, and equipment for one frame control unit per SD-1A209-01, Fig. 2 and 8.

J1A043BC (AT&TCo Std)—Scanner Matrix Upper Unit

Equipment—J1A043BC-()

List 1—Assembly, wiring, and equipment for one scanner matrix upper unit per SD-1A209-01, Fig. 3.

J1A043BD (AT&TCo Std)—Scanner Matrix Lower Unit

Equipment—J1A043BD-()

List 1—Assembly, wiring, and equipment for one scanner matrix lower unit per SD-1A209-01, Fig. 4.

J1A043BE (AT&TCo Std)—Fuse Panel Unit

Equipment—J1A043BE-()

List 2—Assembly, wiring, and equipment for one fuse panel unit per SD-1A209-01, Fig. 9.

5. GENERAL NOTES

5.01 The gauge and type of wire furnished for the master scanner frame shall conform to the requirements of ED-1A153-01.

5.02 Switchboard cables shall be arranged in the cable rack compartments as follows:

SHIELD NO.	CONDUCTORS
1	Communications bus
2	Master scanner except for miscellaneous trunks Tip and ring
3	Miscellaneous trunk scanner leads Signal distributor leads
4	Power cables

Special conditions applying to these leads are listed in Specification J1A056, Limiting Conductor Conditions.

5.03 When assigning cable runs, care should be taken to insure that approximately equal amounts of cable are run down each side of the frame.

5.04 Resistors and strapping on ferroids are indicated on connecting circuits.

5.05 Codes J1A043C through J1A043Y, J1A043AF through J1A043AY, and J1A043BF through J1A043BY are unassigned.

List of A&M Only and Mfr Disc. Equipment

The following equipment has been replaced as indicated. Where A&M Only items appear, the issue numbers shown are those of the issue in which the rating was first applied.

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EQUIPMENT	RATING	DETAILS LAST SHOWN IN ISSUE	REPLACING EQUIPMENT	EQUIPMENT	RATING	DETAILS LAST SHOWN IN ISSUE	REPLACING EQUIPMENT
J1A043A	Mfr Disc.	1	J1A043B	J1A043B,L1	Mfr Disc.	1	J1A043B,L2 & L3
J1A043AA	Mfr Disc.	1	—	J1A043BA,L1	Mfr Disc.	1	J1A043BA,L2 & L3
J1A043AB	Mfr Disc.	1	—	J1A043BB,L1	Mfr Disc.	1	J1A043BB,L2
J1A043AC	Mfr Disc.	1	—	J1A043BE,L1	Mfr Disc.	1	J1A043BE,L2
J1A043AD	Mfr Disc.	1	—				
J1A043AE	Mfr Disc.	1	—				

TABLE A

MASTER SCANNER FRAME J1A043B

UNIT		QUANTITY TO BE PROVIDED		TITLE OF UNIT AND DESCRIPTION OF FEATURE OR OPTION
J CODE	LIST NO.	ALWAYS	FOR OPTION INDICATED	
J1A043BA	2	1		Peripheral Bus and Scanner Control Unit – Common Equip.
	3		1	For No. 1 ESS Office Arranged With 2-Wire, 4-Wire, and Data Features
	4		1	For No. 2 ESS Office Arranged With 2-Wire Features or Automatic Intercept Center No. 1A in AIS
	5	1		Power Status and Alarm Reporting
J1A043BB	2	1		Frame Control Unit
J1A043BC	1	1		Scanner Matrix Upper Unit
J1A043BD	1	1		Scanner Matrix Lower Unit
J1A043BE	2	1		Fuse Panel Unit
J1A053K	1	1		Filter Unit

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